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920673-907240

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE THE APPLICATION OF	)
	)
David O'Connell	) Examiner: Kevin D. Mew
	)
SERIAL NO. 09/680,829	) Group Art Unit No. 2664
	)
FILED: October 6, 2000	) Customer number: 23644
	)
FOR: Monitoring Quality of Service in Packet-Based Communications	)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450," on September 12, 2005.
Name of person signing Minnie Wilson
Signature Minnie Wilson

BRIEF ON APPEAL

This Appeal is from the Examiner's final rejection of claims 1-13, 18-20, 27-31, 33-37, 40-42 and 44-53 in the final Office Action dated January 13, 2005. A timely Notice of Appeal was filed with the Patent and Trademark Office on July 12, 2005 given the Advisory Action of the Examiner of June 21, 2005 following the filing of a timely response on March 11, 2005.

The Appeal Brief fee of $500.00 is also tendered herewith.

(i) REAL PARTY IN INTEREST

The Assignee, Nortel Networks Limited, is the real party in interest in the pending appeal.

(ii) RELATED APPEALS AND INTERFERENCES

Applicants are unaware of any other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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(iii) STATUS OF CLAIMS

Claims 1-54 are pending in the Application. Claim 54 has been allowed, and claims 14-26, 32, 38-39 and 43 have been indicated to contain allowable subject matter.

This appeal is in respect of the rejection of claims 1-13, 18-20, 27-31, 33-37, 40-42 and 44-53.

(iv) STATUS OF AMENDMENTS

Subsequent to the final rejection, an amendment was filed to claim 1 changing the word "sessions" to "session" in line with a requirement from the examiner. This amendment was not entered.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

The invention is used in the field of packet-based telephony, such as Voice over Internet Protocol (VoIP) telephony or video calls made over the Internet or some other packet-based network.

Because quality of service (QoS) in IP telephony is normally rather subjective, the present invention resides in dynamically measuring the QoS while the call is in progress, and in providing the user with dynamic indication giving an objective measure of the QoS.

The dynamic measurement is performed by transmitting a series of test packets across the network, and monitoring transmission characteristics for the test packets (see page 4, line 22 to page 5, line 2). A metric of network performance can be dynamically calculated from the measurements made, and based on the metric, an indication is given to the user.

The dynamic indication of QoS can be presented to the user in a number of ways, such as visually or aurally, some examples of which are described at page 3, lines 13-21.

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

There are four separate rejections of certain of the claims of the application that are to be considered on this Appeal, as follows:

Claims 1-4, 7-11, 27-31, 33-36, 44-47 and 50-53 have been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Schuster U.S. Patent No. 6,363,053 in view of Scott U.S. Patent No. 6,480,898.

Claims 5-6 have been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Schuster in view of Scott, and further in view of Vaid, U.S. Patent No. 6,520,131.

Claims 12-13 and 37 have been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Schuster in view of Scott, and further in view Brueckheimer published U.S. Application 2002/0087370. However, this rejection is improper, as discussed below.

Finally, claims 48, 49 have been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Schuster in view of Brueckheimer, and further in view of Scott. This rejection, however, is also improper as discussed below.

Applicant is content to allow the patentability of the group of claims 1-13, 18-20, 27-31, 33-37, 40-42, 44-47 and 50-53 to be decided with reference to claim 1, and claims 48 and 49 to be decided with reference to claim 48.

(vii) ARGUMENT

There are five issues resulting from the Examiner's rejections, as follows:

Issue 1: Whether in the determination of obviousness under 35 USC § 103 the Examiner erred in finding that Schuster et al. (US Patent Specification No. 6,363,053) discloses a method which includes the step of providing, at an endpoint, a dynamic indication of the network performance based on a calculation performed during a telecommunications session involving the endpoint.

Issue 2: Whether in the determination of obviousness under 35 USC § 103 the Examiner erred in finding that the gateway server disclosed by Scott et al. (US Patent Specification No. 6,480,898) can be read onto "an endpoint [which] is a telecommunications device enabling a user to participate in a telecommunications session over the network".

Issue 3: Whether in the determination of obviousness under 35 USC § 103 the Examiner erred in ascertaining the difference between the prior art as a whole and the subject-matter of independent claims 1, 34 and 50

Issue 4: Whether in the determination of obviousness under 35 USC § 103 the Examiner erred in using Schuster et al. as a starting point for an evaluation of obviousness of claim 48.

Issue 5: Whether in the determination of obviousness of the subject-matter of claims 12-13, 37, 48 and 49 under 35 USC § 103 the Examiner erred in relying on Brueckheimer et al (US Publication No. 2002/0087370).

Rejection under 35 USC § 103 of claims 1-13, 18-20, 27-31, 33-37, 40-42, 44-47 and 50-53

Issue 1: Schuster fails to disclose dynamic indication of network performance at an endpoint

Claim 1 requires that QoS is monitored between two points, one of which is an endpoint, and the final integer of the claimed method is the step of:

> *"providing at said telecommunications device* [i.e. the endpoint] *a dynamic indication of the network performance based on said calculation* [of a measure of network performance] *during said telecommunications session."*

In the post-final advisory action dated June 21, 2005, the Examiner commented that Applicants' arguments on this point were not convincing because the quoted feature "does not necessarily mean that the dynamic indication is being displayed".

Applicants agree that the dynamic indication is not necessarily "displayed" at the endpoint. However, it must be "provided" at the endpoint. In this regard, the specification provides examples at page 3, lines 13-21 of indications which are displayed and indications which are provided in alternate manner, e.g. as a sound.

According to the Examiner, the method carried out by Schuster can be read onto this feature. Schuster discloses a method of testing compliance with service level agreements, in which test packets are transmitted (not during a call, but separately) between two network devices, and resultant transmission characteristics are measured. In all cases, Schuster simply carries out a set of measurements outside the context of a call, and only then, after the information has been collected, is a comparison made with an SLA to determine compliance. (For confirmation that the QoS characteristics are only compared to the SLA afterwards, see column 9, line 41; column 10, line 23; column 10, line 65). A report may then be generated to show the compliance or otherwise, with the SLA, or the data can be stored for periodic reports to be prepared later.

There is no dynamic indication provided at any endpoint, however, which would allow a user to be provided with an indication of current, dynamically measured network performance during a call.

It appears from the Examiner's arguments that the mere fact that the measurements made by Schuster (at a server) can change as the network characteristics change, is considered sufficient to read onto the feature that a dynamic indication is provided at an endpoint. Applicants disagree and point out that although the measurements will be made by Schuster in real time, they are made at a different time to the call. Furthermore, the measurements are simply collected, stored and then compared with an SLA, they are not provided as a dynamic indication at an endpoint as claim 1 requires.

Applicants therefore submit that each and every element as set forth in the claim is neither expressly described nor inherently described in Schuster and therefore argues that the claims are not anticipated using the criteria set forth in *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), which stated: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."

Issue 2: Scott's gateway server is not a telecommunications device within the meaning of claim 1

This issue could not be simpler. Applicants argue that a gateway server, which is located at a midpoint along the network connection between two users involved in a call, cannot be a "telecommunications device" as claimed in claim 1. Such a "telecommunications device" is required to have the following characteristics:

- It must be one of the endpoints in communications made between two points over the network.
- It must enable a user to participate in a telecommunications session over the network
- It must allow the provision of a dynamic indication of network performance during the telecommunications session.

All of these requirements are explicitly stated in claim 1.

It is self evident that a server of the type disclosed by Scott et al. cannot be considered an endpoint in a telecommunications session. It is a midpoint.

It is further evident that the device which enables a user to participate in a telecommunications session is the user's telephone, computer, or handset. Most users will not be aware that entities such as servers even exist. They certainly will not employ them (except in the most indirect sense) to participate in voice or video calls.

As an analogy, suppose a claim mentioned "a device for enabling a user to watch a television broadcast", and the examples given were of a television set and a PC with a TV tuner card. Such a clause would not normally be interpreted as covering the antenna of a television broadcast mast. Nevertheless the logic of the rejection made in this case would dictate that because the antenna facilitates watching television, it should read onto the clause. Applicants submit that the claimed clause should be given a more realistic and less fanciful interpretation, and that only devices which can provide the necessary indication to the user and which the user can employ to participate in telecommunications sessions should read onto the claimed telecommunications device.

Issue 3: Schuster and Scott, taken in combination, fail to teach or fairly suggest the claimed invention.

The skilled person, on reading both Schuster and Scott, and without any foreknowledge of the instant invention, lacks any teaching or suggestion of certain key aspects of the invention.

Schuster is solely concerned with ensuring that a contract with an ISP meets the basic promises of QoS levels specified in the contract. As such, Schuster is concerned with periodically making some spot checks of the QoS metrics, and comparing these against the specified minima in the SLA. Schuster contains no teaching or suggestion that end-users, involved in calls over a network, should be given a dynamic indication of the current QoS.

Scott is aimed at the carrier exchange (CX) market – where several VoIP providers have private, geographically limited networks, carrier exchange systems allow traffic from several such providers to be transferred, providing each carrier with increased range and better quality long distance service.

In particular, Scott is concerned with providing a CX management system. The system of Scott monitors traffic in order to accumulate billing information, statistics, and the like which enable the system administrator to perform accounting functions and to identify opportunities for expanding the network. There is no teaching or

suggestion of a real time display for the network administrator, and certainly no suggestion of providing QoS metrics to end users.

Therefore, the two references relied on in rejecting claims 1, 34 and 50, are aimed at different network administration and billing tasks, with no consideration being given to enhancing the experience of end-users involved in packet-based telephony calls. The two references are silent on any suggestion that the user's handset or PC or other telecommunications device should be modified or enhanced in any way. But the present invention is concerned with just this aspect.

Applicants therefore submit that the motivation to make the combination is not found in the prior art. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) established that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. Although it is established that motivation need not be expressly stated in the prior art references, and can for example be found in the nature of the problem to be solved (*Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1276, 69 USPQ2d 1686, 1690 (Fed. Cir. 2004)), the present circumstances are demonstrably different to those of *Ruiz v. Chance.* In that case, the prior art references were both concerned with solutions to the problem of underpinning slumping foundations, and therefore there was a motivation to combine the references when addressing this problem again. However, in this case, Schuster is concerned with problems of ensuring compliance with SLAs and Scott is concerned with problems of improving carrier exchange administration and billing.

Applicants urge the Board to recognize that a skilled artisan, faced with the disclosures of Schuster and Scott, would have no motivation whatsoever to address the problem of enhancing the provision of information to users involved in packet-based telephony, and without knowledge of the invention, Schuster and Scott when considered together would motivate the skilled person only to consider adaptations of the SLA compliance monitoring of Schuster or the CX management system of Scott.

Issue 4: Schuster is effectively irrelevant to the consideration of obviousness of claim 48.

Claim 48 is directed to a telephone handset which has a display device for displaying a dynamic indication of network performance, based on the transmission characteristics of test packets transmitted across a network to which the handset is attached while a telecommunications session including the handset is in progress.

The rejection of this claim, in the final office action, states that Schuster discloses all the aspects of the claimed invention, except that it fails to disclose that a handset is used for displaying a dynamic indication ... [it continues by paraphrasing the entirety of claim 48].

In other words, the rejection itself acknowledges, in its summary of the relevance of Schuster to claim 48, that it discloses none of the limitations of the claim!

This evaluation is correct, of course. Schuster contains no disclosure of a handset having a display as set forth in claim 48. Accordingly, Schuster is irrelevant to the rejection; however it is the primary reference of this rejection.

Issue 5: The Brueckheimer reference is not prior art

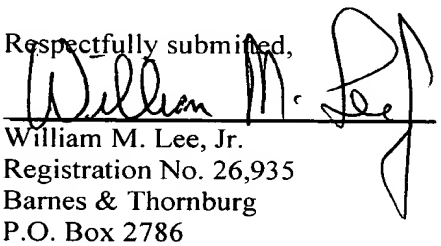
Brueckheimer's US Publication 2002/0087370) was, at the time this invention was made, owned by the same person or subject to an obligation of assignment to the same person as the claimed invention. The assignment to Nortel Networks Limited was recorded on April 20, 2001 on Reel 011735 Frame 0884. Thus, the reference is not prior art under 35 USC § 103 by virtue of paragraph (c).

Accordingly, Schuster is fundamentally irrelevant to claims 12-13, 37, 48 and 49 for the reasons given above, and Brueckheimer is not prior art due to common assignment. The only remaining reference in the chain of argument is Scott. The comments made earlier regarding the disclosure of Scott and its lack of relevance outside the field of CX management apply equally in relation to claim 48. Nothing in Scott teaches a handset having the required display characteristics.

Therefore, given the foregoing, while the allowance of claim 54 is gratefully acknowledged, and while the indicated allowability of the subject matter of claims 14-26, 32, 38-39 and 43 is also gratefully acknowledged, it is submitted that the remaining rejections of the claims are in error, and the Examiner should be reversed. Such action is therefore solicited.

September 12, 2005

Respectfully submitted,



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CLAIMS APPENDIX

What is claimed is:

1. A method of monitoring quality of service in communications over a packet-based network between two points, at least one of which is an endpoint,

wherein said endpoint is a telecommunications device enabling a user to participate in a telecommunications sessions over the network;

the method comprising the steps of:

transmitting test packets across the network while a telecommunications session including said telecommunications device is in progress and monitoring transmission characteristics of said test packets;

dynamically calculating from said transmission characteristics a measure of network performance; and

providing at said telecommunications device a dynamic indication of the network performance based on said calculation during said telecommunications session.

2. A method according to claim 1, wherein said transmission characteristics are selected from packet loss, transmission delay, and a combination thereof.

3. A method according to claim 2, wherein said transmission characteristics include both packet loss and transmission delay.

4. A method according to claim 1, wherein the indication of the network performance is provided by means of a visual display associated with the endpoint.

5. A method according to claim 1, wherein the indication of the network performance is provided by means of an aural signal provided to the endpoint.

6. A method according to claim 5, wherein the aural indication of the network performance is provided as a discrete signal emitted at the endpoint when the value of the metric passes a predetermined point.

7. A method according to claim 1, wherein said test packets include a first series of test packets which issue from a source location to a destination location and a second series of test packets which issue from said destination location to said source location in response to said first series of test packets, whereby said network characteristics may be monitored by comparing the first and second series of test packets.

8. A method according to claim 7, wherein the first series of test packets include local source timestamp information and wherein the second series of test packets include local destination timestamp information, the difference between said local source timestamp information and local destination timestamp information being used to calculate a delay characteristic of the network.

9. A method according to claim 8, wherein the delay characteristic is the absolute delay in echo-free connections (Ta) between the source and destination locations over the network.

10. A method according to claim 7, wherein a measure of packet loss is obtained by comparing the packets issued from the source location and the packets received back at the source location.

11. A method according to claim 9, wherein a measure of packet loss is obtained by comparing the packets issued from the source location and the packets received back at the source location.

12. A method according to claim 11, wherein the measure of packet loss and the identity of the communications codec being employed by the endpoint are used to calculate an equipment impairment factor (Ie).

13. A method according to claim 12, wherein the calculation of Ie is made by looking up the measured packet loss in a stored table which correlates values of Ie with packet loss values for the codec being used.

14. A method according to claim 11, wherein the calculated value of Ta is used to calculate a delay impairment factor.

15. A method according to claim 14, wherein the delay impairment factor (Idd) is given by the formulae:

(i) for Ta < 100ms,

Idd = 0; and

(ii) for Ta => 100 ms,

Idd = 25*((1+X6)1/6 - 3*(1+(X/3)6)1/6 + 2)

Where X = (log(Ta/100))/log(2)

16. A method according to claim 15, wherein a transmission rating factor R is calculated from the formula R = Y - Idd - Ie, where Y is a constant which has been predetermined for the network and the equipment being used on the network, and wherein Ie is an equipment impairment factor calculated from the measure of packet loss and the identity of the communications codec being employed by the endpoint.

17. A method according to claim 16, wherein the calculation of Ie is made by looking up the measured packet loss in a stored table which correlates values of Ie with packet loss values for the codec being used.

18. A method according to claim 17, wherein the value of Y is from about 92 to about 97.

19. A method according to claim 18, wherein the value of Y is from about 93 to about 95.

20. A method according to claim 19, wherein the value of Y is about 94.5.

21. A method according to claim 16, wherein the calculated value of R is correlated to a subjective metric for the quality of service, and wherein an indication of the value of said subjective metric is provided at the endpoint to a user.

22. A method according to claim 21, wherein said metric is a mean opinion score (MOS) and is calculated according to the formula:

MOS = 1 + 0.035R + R(R-60)(100-R)(7x10-6)

23. A method according to claim 22, wherein said MOS is further adjusted before being provided as an indication at the endpoint, by normalising acceptable values of MOS to a different scale.

24. A method according to claim 21, wherein the indication of the value of the subjective metric is provided by means of a visual display associated with the endpoint.

25. A method according to claim 21, wherein the indication of the value of the subjective metric is provided by means of an aural signal provided to the endpoint.

26. A method according to claim 25, wherein the aural indication is provided as a discrete signal emitted at the endpoint when the value of the metric passes a predetermined point.

27. A method according to claim 1, wherein the step of providing a dynamic indication of the network performance includes providing, at the request of a user, an indication of one or more of said transmission characteristics.

28. A method according to claim 27, wherein the request of the user is made by means of an input device associated with the endpoint and the indication is provided by means of a display device associated with the endpoint.

29. A method according to claim 1, further comprising the step of logging the network transmission characteristics.

30. A method according to claim 1, further comprising the step of logging the results of said calculation.

31. A method according to claim 30, wherein the step of logging the results of said calculation occurs only when said results are within a predetermined range.

32. A method according to claim 30, wherein the step of logging also includes logging the fact that a communications connection over the network has been lost.

33. A method according to claim 1, further comprising the step of adjusting a billing record for a user in dependence on the results of said calculation.

34. A computer program product in machine readable form containing instructions which, when executed on a computer associated with an endpoint connected to a packet-based network , said endpoint being a telecommunications device enabling a user to participate in a telecommunications session over said network, cause said computer to:

monitor transmission characteristics of test packets transmitted across the network while a telecommunications session including said telecommunications device is in progress;

dynamically calculate from said transmission characteristics a measure of network performance; and

provide to said user at said endpoint a dynamic indication of the network performance based on said calculation during said telecommunications session.

35. A computer program product according to claim 34, wherein said transmission characteristics are selected from packet loss, transmission delay, and a combination thereof.

36. A computer program product according to claim 35, wherein the transmission characteristics include the absolute delay in echo-free connections (Ta) between source and destination locations over the network, obtained by comparing local timestamp information from source and destination locations on the network and a measure of packet loss obtained by comparing the packets issued from the source location and the packets received back at the source location.

37. A computer program product according to claim 36, wherein the measure of packet loss and the identity of the communications codec being employed by the endpoint are used to calculate an equipment impairment factor (Ie).

38. A computer program product according to claim 37, wherein a delay impairment factor (Idd) is given by the formulae:

(i) for $Ta < 100ms$,

$Idd = 0$; and

(ii) for Ta => 100 ms,

$$Idd = 25*((1+X6)1/6 - 3*(1+(X/3)6)1/6 + 2)$$

Where $X = (\log(Ta/100))/\log(2)$

39. A computer program product according to claim 38, wherein a transmission rating factor R is calculated from the formula R = Y - Idd - Ie, where Y is a constant which has been predetermined for the network and the equipment being used on the network, and wherein Ie is an equipment impairment factor calculated from the measure of packet loss and the identity of the communications codec being employed by the endpoint.

40. A computer program product according to claim 39, wherein the value of Y is from about 92 to about 97.

41. A computer program product according to claim 40, wherein the value of Y is from about 93 to about 95.

42. A computer program product according to claim 41, wherein the value of Y is about 94.5.

43. A computer program product according to claim 39, wherein the calculated value of R is correlated to a subjective metric for the quality of service, and wherein an indication of the value of said subjective metric is provided at the endpoint to a user.

44. A computer program product according to claim 34, wherein provision of a dynamic indication of the network performance includes providing, at the request of a user, an indication of one or more of said transmission characteristics.

45. A computer program product according to claim 34, further comprising instructions which when executed cause a computer to log the network transmission characteristics.

46. A computer program product according to claim 34, further comprising instructions which when executed cause a computer to log the results of said calculation.

47. A computer program product according to claim 34, further comprising instructions which when executed cause a computer to adjust a billing record for the a in dependence on the results of said calculation.

48. A telephone handset for connection to a packet-based network, having a display device for displaying a dynamic indication of network performance based on the transmission characteristics of test packets transmitted across a network to which the handset is attached while a telecommunications session including said handset is in progress.

49. A telephone handset according to claim 48, further comprising a processor for calculating a measure of network performance based on the transmission characteristics of test packets transmitted by the handset across the network.

50. A system for monitoring quality of service in communications over a packet-based network, comprising:

a source endpoint connected to the network via which a user may transmit communication signals as part of a communications session over the network wherein said source endpoint is a telecommunications device enabling a user to participate in a telecommunications session over the network;

a test packet generator for transmitting test packets across the network during said communications session

a test packet receiver for receiving test packets from the network during said communications session;

a processor for measuring transmission characteristics of said test packets and for calculating from said transmission characteristics a measure of network performance; and

an output device with said telecommunications device for providing a dynamic indication of the network performance to said user during said communications session based on said calculation.

51. A system according to claim 50, wherein said test packet generator includes a timestamp generator for adding a local source timestamp to said test packets.

52. A system according to claim 51, further comprising a destination endpoint with which said source endpoint is in communication over the network, said destination endpoint having associated therewith: a test packet receiver for receiving test packets from the network; a timestamp generator for adding a local destination timestamp to said received test packets; and a test packet re-transmitter for re-transmitting said received test packets with said local destination timestamp back to their source.

53. A system according to claim 52, further comprising a centralised time server in communication with the network for generating a standardised time and providing same to said source and destination endpoints.

54. A method of monitoring quality of service in communications over a packet-based network between two points, at least one of which is an endpoint, comprising the steps of:

transmitting a first series of test packets location across the network from a source location to a destination, said first series of test packets including local source timestamp information;

transmitting a second series of test packets location across the network from said destination to said source location in response to the first series, said second series of test packets including local destination timestamp information;

measuring the difference between said local source timestamp information and local destination timestamp information; and

calculating from said measured difference the absolute delay in echo-free connections (Ta) between the source and destination locations over the network and thereby calculating a delay impairment factor;

providing at said endpoint a dynamic indication of the network performance based on said delay impairment factor.

EVIDENCE APPENDIX and RELATED PROCEEDINGS APPENDIX

There is no evidence appendix or related proceedings appendix.